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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/649,120	08/28/2000	Thierry Laurent	P00039902	7048

7590 11/02/2005

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EXAMINER	
SHINGLES, KRISTIE D	
ART UNIT	PAPER NUMBER
2141	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/649,120	LAURENT ET AL.	
	Examiner	Art Unit	
	Kristie Shingles	2141	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *54-92* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *54-92* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant has not amended any claims.
Claims 54-92 are pending.

Response to Arguments

1. Applicant's arguments (see Remarks pages 12-15), filed 8/18/2005, with respect to the rejection(s) of claims 54 under 35 USC § 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of *Black* (USPN 6,813,686).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 54-60, 62-68, 70-76, 78-84, and 86-92** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nolan et al* (USPN 6,640,278) in view of *Black* (USPN 6,813,686).

a. **Regarding claims 54, 62 and 70,** *Nolan et al* teach a method, computer program product, and apparatus for managing a storage area network (SAN), the method comprising: defining storage domains respectively having associated configurable storage management

properties that are separate from individual physical capabilities of physical storage resources available through the SAN (Abstract, col.2 lines 34-35, col.6 lines 13-19); accommodating the creation of logical volumes configurable for presentation to hosts through the SAN (col.16 lines 19-25, col.28 lines 16-17) and allocating the logical volumes to hosts in the context of the storage domains (col.2 lines 45-51 and 57-67, col.6 lines 13-14, col.10 lines 33-39).

Although *Nolan et al* teach a storage domain management system that supports storage domains and manages storage resources in a storage network according to storage domains, wherein storage domains are managed by assigning a logical storage extent to a client within the network and by mapping storage resources in the network to the logical storage extents of the clients (Abstract, col.2 lines 18-28 and 57-67). *Nolan et al* also teaches logic for configuring a set of storage locations from the one or more storage systems in the network as a storage domain for a set of at least one client (col.2 lines 23-28). Furthermore, *Nolan et al* teach that the resources within storage domains are defined using virtual circuits and configurable logic (col.3 lines 1-5). Thus, although *Nolan et al* does not explicitly state two distinct storage domains—*Nolan et al* clearly disclose storage domains (more than one) managed according to the configuration logic of the storage domain manager for respective clients (col.2 lines 23-34 and 46-52, col.5 lines 15-29, col.34 lines 50-64). Nonetheless, *Nolan et al* fails to explicitly teach wherein a first set of storage management properties is associated with a first storage domain and a second set of storage management properties is associated with a second storage domain, with the first set of storage management properties being different from the second set of storage management properties;

wherein allocating a first logical volume to a first host in the context of the first storage domain entails the provision of storage resources according to the first set of storage management properties and allocating a second volume to a second host in the context of the second storage domain entails the provision of storage resources according to the second set of storage management properties.

However, *Black* clearly teaches allocation of logical volumes in storage domains to hosts according to the management properties associated with the logical volumes in the domains, the creation of logical volumes configurable for presentation to host through the SAN, and allocation of logical volumes to a first host in context with the first storage domain's resources and the allocation of logical volumes to a second host in context with other storage domain resources (col.9 lines 35-65, col.10 lines 14-53, col.11 lines 11-57, col.18 line 16-27, col.20 line 45-col.21 line 38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of *Nolan et al* and *Black* for the purpose of provisioning multiple storage domains to allocate logical volume to respective host, wherein the allocation of the volumes within the storage domain is in affiliation with the properties of each managed volume; because access to a storage resources should be consistent with the properties and attributes of the resources being allocated. It is obvious to provision more than one storage domain and to allocate resources based on the properties of each domain.

b. **Regarding claim 78,** *Nolan et al* teach a storage area network (SAN) that accommodates presentation of logical volumes to hosts and associates access to storage with configurable storage management properties defined by a storage domain, the storage area

network comprising: storage domains respectively defined to have associated configurable storage management properties that are separate from individual physical capabilities of physical storage resources available through the SAN (col.2 lines 34-35 and col.6 lines 13-19); logical volumes configurable for presentation to hosts through the SAN (col.16 lines 19-25, col.28 lines 16-17); and means for allocating the logical volumes to hosts in the context of the storage domains (col.2 lines 45-51 and 57-67, col.6 lines 13-14, col.10 lines 33-39).

Although *Nolan et al* teach a storage domain management system that supports storage domains and manages storage resources in a storage network according to storage domains, wherein storage domains are managed by assigning a logical storage extent to a client within the network and by mapping storage resources in the network to the logical storage extents of the clients (Abstract, col.2 lines 18-28 and 57-67). *Nolan et al* also teaches logic for configuring a set of storage locations from the one or more storage systems in the network as a storage domain for a set of at least one client (col.2 lines 23-28). Furthermore, *Nolan et al* teach that the resources within storage domains are defined using virtual circuits and configurable logic (col.3 lines 1-5). Thus, although *Nolan et al* does not explicitly state two distinct storage domains—*Nolan et al* clearly disclose storage domains (more than one) managed according to the configuration logic of the storage domain manager for respective clients (col.2 lines 23-34 and 46-52, col.5 lines 15-29, col.34 lines 50-64). Nonetheless, *Nolan et al* fails to explicitly teach wherein a first set of storage management properties is associated with a first storage domain and a second set of storage management properties is associated with a second storage domain,

with the first set of storage management properties being different from the second set of storage management properties; wherein allocating a first logical volume to a first host in the context of the first storage domain entails the provision of storage resources according to the first set of storage management properties and allocating a second volume to a second host in the context of the second storage domain entails the provision of storage resources according to the second set of storage management properties.

However, *Black* clearly teaches allocation of logical volumes in storage domains to hosts according to the management properties associated with the logical volumes in the domains, the creation of logical volumes configurable for presentation to host through the SAN, and allocation of logical volumes to a first host in context with the first storage domain's resources and the allocation of logical volumes to a second host in context with other storage domain resources (col.9 lines 35-65, col.10 lines 14-53, col.11 lines 11-57, col.18 line 16-27, col.20 line 45-col.21 line 38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of *Nolan et al* and *Black* for the purpose of provisioning multiple storage domains to allocate logical volume to respective host, wherein the allocation of the volumes within the storage domain is in affiliation with the properties of each managed volume; because access to a storage resources should be consistent with the properties and attributes of the resources being allocated. It is obvious to provision more than one storage domain and to allocate resources based on the properties of each domain.

c. **Regarding claims 55, 63, 71, and 79,** *Nolan et al* and *Black* teach the method of claims 54, 62, 70, and 78, *Nolan et al* further teach wherein presentation of logical volumes to hosts accommodates storage resource access by hosts without requiring hosts to be configured

according to the requirements of the physical storage resources (col.10 lines 33-39, col.33 lines 40-45).

d. **Regarding claims 56, 64, 72, and 80,** *Nolan et al* further teach the method of claims 55, 63, 71, and 79, wherein the first logical volume and the second logical volume are a common logical volume (col.16 lines 19-25, col.28 lines 16-17), with allocation of the common logical volume to the first host subject to the first set of storage management properties and allocation of the common logical volume to the second host subject to the second set of storage management properties (col.2 lines 25-29, col.5 lines 15-29).

e. **Regarding claims 57, 65, 73, and 81,** *Nolan et al* and *Black* teach the method of claims 54, 62, 70, and 78, *Nolan et al* further teach wherein the storage management properties comprise a guaranteed storage capacity (col.33 lines 30-33, col.35 lines 3-11).

f. **Regarding claims 58, 66, 74, and 82,** *Nolan et al* and *Black* teach the method of claims 54, 62, 70, and 78, *Nolan et al* further teach wherein the storage management properties comprise a guaranteed I/O properties that include an I/O bandwidth and/or an I/O operations (col.4 line 66-col.5 line 2, col.35 lines 32-34).

g. **Regarding claims 59, 67, 75, and 83,** *Nolan et al* and *Black* teach the method of claims 54, 62, 70, and 78, *Nolan et al* further teach wherein the storage management properties comprise a guaranteed availability (col.2 lines 2-9, col.3 lines 7-11).

h. **Regarding claims 60, 68, 76, and 84,** *Nolan et al* and *Black* teach the method of claims 54, 62, 70, and 78, *Nolan et al* further teach wherein the storage management properties comprise a guaranteed performance (col.2 lines 2-9, col.3 lines 7-11).

i. **Regarding claims 86, 88, 90, and 91,** *Nolan et al* teach the method of claims 56, 64, 70, and 80, wherein the first set of storage management properties includes a first class of service and the second set of storage management properties including a second class of service, whereby access of the common volume by the first and second hosts entails differing classes of service (col.16, lines 24-25 and table 2).

j. **Regarding claims 87, 89, and 92,** *Nolan et al* and *Black* teach the method of claims 54, 62, and 78, *Nolan et al* further teach wherein the first and second sets of storage management properties are softly configured such that they are reconfigurable without requiring an update of the connections to the physical storage resources (col.2 lines 45-52, col.33 lines 29).

4. **Claims 61, 69, 77, and 85** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nolan et al* (USPN 6,640,278) in view of *Hubis et al* (6,343,324).

Regarding claims 61, 69, 77, and 85, *Nolan et al* and *Black* teach the method of claim 54, 62, 70, and 78 as applied above. Yet *Nolan et al* and *Black* fail to teach wherein the storage management properties comprise a guaranteed integrity. However, *Hubis et al* teach wherein the storage management properties comprise a guaranteed integrity (col.7 lines 46-51). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method for configuration of storage resources in a storage network by *Nolan et al* and *Black* by wherein the storage management properties comprise a guaranteed integrity because it is key that the storage systems maintain the integrity of the data stored within the logical volumes.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: *Ito et al* (USPN 6,947,938), *Honma et al* (USPN 6,950,871), *Schubert et al* (USPN 6,742,034), *Latif et al* (USPN 6,400,730).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kristie Shingles whose telephone number is 571-272-3888. The examiner can normally be reached on Monday-Friday 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on 571-272-3880. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kristie Shingles
Examiner
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SUPERVISORY PATENT EXAMINER